



George C. Marshall Space Flight Center

QD-PA-001

Revision E

EFFECTIVE DATE: February 3, 2006

ORGANIZATIONAL INSTRUCTION

MSFC S&MA SHUTTLE OUT OF FAMILY ASSESSMENT

OPR(s)

QD10, QD20, QD30

OPR DESIGNEE

Tom Hartline

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		10-21-97	
Revision	A	7/1/99	Changes made to reflect new organization code changes and/or Changes made to reflect new directives renumbering scheme and to incorporate the corrective action for closure of NCR 266
Revision	B	9/3/02	Changed numbering scheme to remove department identifier in OI document number, removed "Expires Date", removed signature blocks, in accordance with QS-A-001 revision F.
Revision	C	05/05/03	Updated with editorial changes due to S&MA reorganization into five departments and various out of date information.
Revision	D	10/15/2004	Updated OI to implement HQ Rules Review in accordance with CAITS Action # 04-DA-01-0387) (Utilizing the word "Shall" for all requirements, removing ambiguity, removing non-requirements, etc.)
Revision	E	2/3/2006	Administrative change – changed OPR designee

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MSFC S&MA SHUTTLE OUT OF FAMILY ASSESSMENT

1. SCOPE

1.1 Scope. This Organizational Issuance (OI) addresses those assessment activities which are performed by QD20 personnel in support of the Space Shuttle Project Offices.

1.2 Purpose. To establish procedures for the accomplishment of out-of-family problem resolution as it applies to MSFC S&MA personnel supporting the Space Shuttle Program.

1.3 Applicability. This Organizational Issuance (OI) is applicable to all QD20 personnel who perform Out of Family Assessment in support of MSFC S&MA.

2. APPLICABLE DOCUMENTS *(to the extent specified herein)*

NPR 1441.1	NASA Records Retention Schedules
NSTS 22206	Requirements for Preparation And Approval Of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL)
NSTS 22254	Methodology for Conduct of Space Shuttle Program Hazard Analysis

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3. DEFINITIONS/ACRONYMS

CCBD	Configuration Control Board Directive
CIL	Critical Items List
COQ	Certificate of Qualification
CPE	Change Package Engineer
CR	Change Request
ECP	Engineering Change Proposals
FRC	Federal Records Center
FMEA	Failure Modes and Effects Analysis
LCC	Launch Commit Criteria
LCN	Launch Commit Criteria Change Notice
MPCP	Manufacturing Process Change Proposals
MRB	Material Review Board
OMRSD	Operations and Maintenance Requirements and Specifications Document
NARA	National Archives and Records Administration
PAS	Problem Assessment System
PCP	Program Change Proposal
PCIN	Program Control Identification Number
PAS PR	Problem Assessment System Problem Report
PRACA	Problem Reporting and Corrective Action
SCN	Software Change Notice
RCN	Requirements Change Notice
S&MA	Safety and Mission Assurance
SCRG	Systems Change Review Group
SR&QA	Safety Reliability and Quality Assurance
SSRP	Systems Safety Review Panel

Where QD20 is referenced in this document, it includes both civil servants and mission support contractors that support QD20 activity.

4. INSTRUCTIONS

4.1 Processing of Changes. QD20 shall be responsible for reviewing changes to program/project documentation and assessing the changes for affect on flight risk.

Changes shall include but are not limited to:

- a. Level II Change Requests (CR's)
- b. Level II Requirements Change Notice (RCN's)
- c. Level II Launch Commit Criteria Change Notice (LCN's)
- d. Level III Engineering Change Proposals (ECP's)
- e. Level III Manufacturing Process Changes

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- f. Level II/III Waivers
- g. Level II/III Deviations
- h. Software Change Notices (SCN's)
- i. Senior Material Review Board (MRB)/Primary MRB Items
- j. S&MA Plan Updates (received as letters or Program Change Proposals (PCP's))
- k. Hazard Report Updates as PCP's.

Changes shall be evaluated for impacts to system safety, reliability and quality assurance requirements. Forms 1-3 in section 7 or similar may be used to assist the discipline reviews. Form 4 in section 7 or similar may be used as the S&MA evaluation that is provided to the responsible party.

Hazard Analysis Revisions and Failure Modes and Effects Analysis/Critical Items List (FMEA/CIL) changes are reviewed as ECPs. Hazard analysis revisions are evaluated to ensure compliance with NSTS 22254. FMEA/CIL revisions are evaluated to ensure compliance with NSTS 22206.

Level II changes which affect more than project shall be coordinated and reviewed by the Shuttle Assurance Department with support from the other QD20 element personnel. The QD20 Shuttle Assurance Department represents QD20 at all System Change Review Group (SCRG) meetings.

The process for reviewing changes is documented in the enclosed flow chart (Appendix A).

4.2 ALERT Processing. QD20 shall be responsible for ensuring the proper disposition of ALERTs which affect MSFC Shuttle Project Elements. The QD20 involvement in the ALERT process shall be documented in the enclosed flow chart (Appendix B).

4.3 Problem Assessment Center (PAC) QD20 shall be responsible for ensuring the proper disposition of PAC problem reports. Appendix C describes the specific QD20 involvement and process flow within the PRACA system.

5. NOTES

5.1 Directive Replacement This Directive replaces QS-PA-001, Revision C, MSFC S&MA Shuttle Out Of Family Assessment.

6. SAFETY PRECAUTIONS AND WARNING NOTES

None

7. APPENDICES, DATA, REPORTS, AND FORMS

Appendix A Change Evaluation Flow Chart

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Appendix B ALERT Processing

Appendix C Problem Assessment Center

Appendix D Systems Safety Evaluation Form

Appendix E Reliability Evaluation Form

Appendix F Quality Assurance Evaluation Form

Appendix G S&MA Shuttle Change Evaluation Form

8. RECORDS

<u>Record</u>	<u>Repository</u>	<u>Period of Time</u>
<p>8.1 S&MA Shuttle Change Evaluation contained in PCIN Change Records.</p> <p>OPR: Boeing North America, Discovery Drive</p>	Hard Copy	<p>NPG 1441.1, NASA Records Retention Schedules</p> <p>8/10</p> <p>Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA</p>
<p>8.2 Disposition of Contractors' ALERT Response</p> <p>OPR: QD10</p>	Hard Copy	<p>NPG 1441.1, NASA Records Retention Schedules</p> <p>8/10</p> <p>Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA</p>

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8.3 PAC PR Disposition OPR: QD10	Hard Copy	NPG 1441.1, NASA Records Retention Schedules 8/10 Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA
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9. TOOLS, EQUIPMENT, MATERIALS

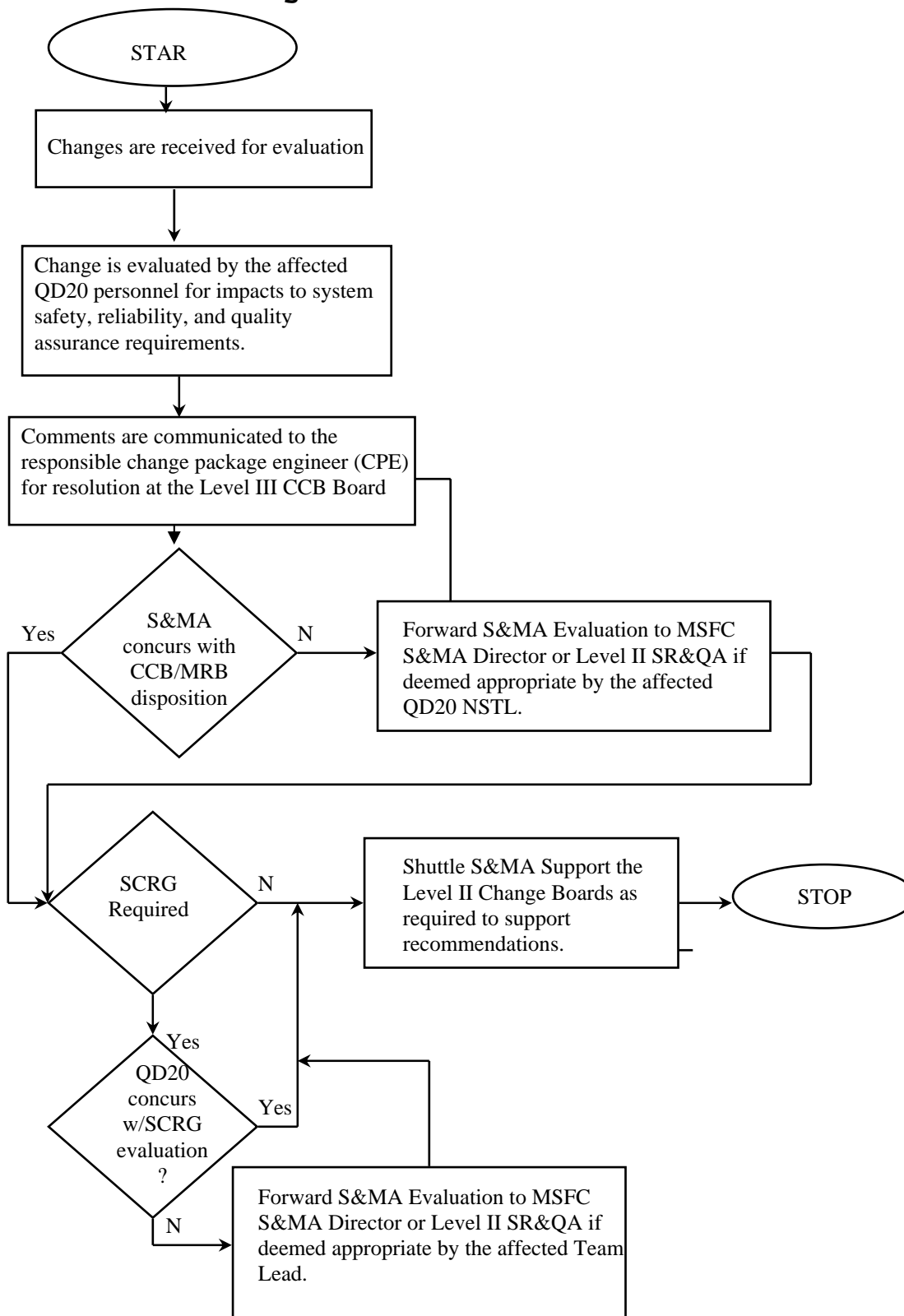
None

10. PERSONNEL TRAINING AND CERTIFICATION

None

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Appendix A Change Evaluation Flow Chart

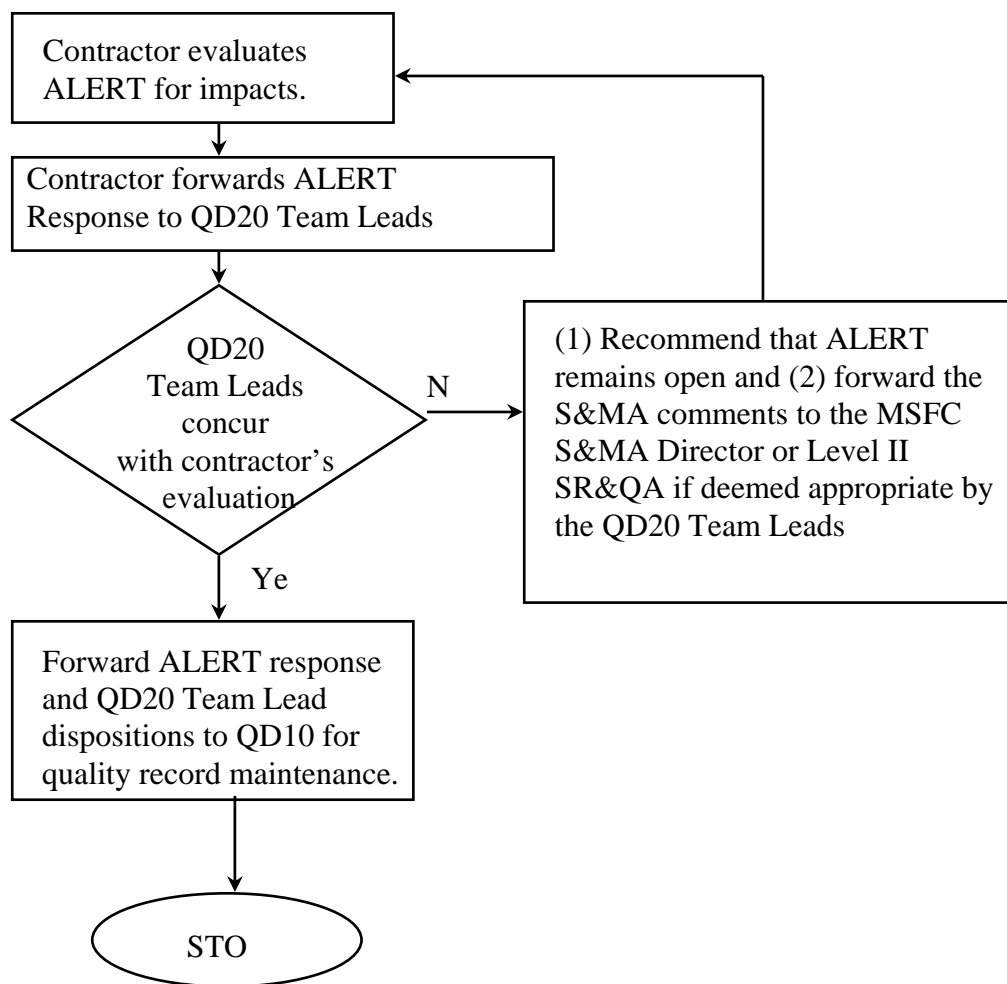


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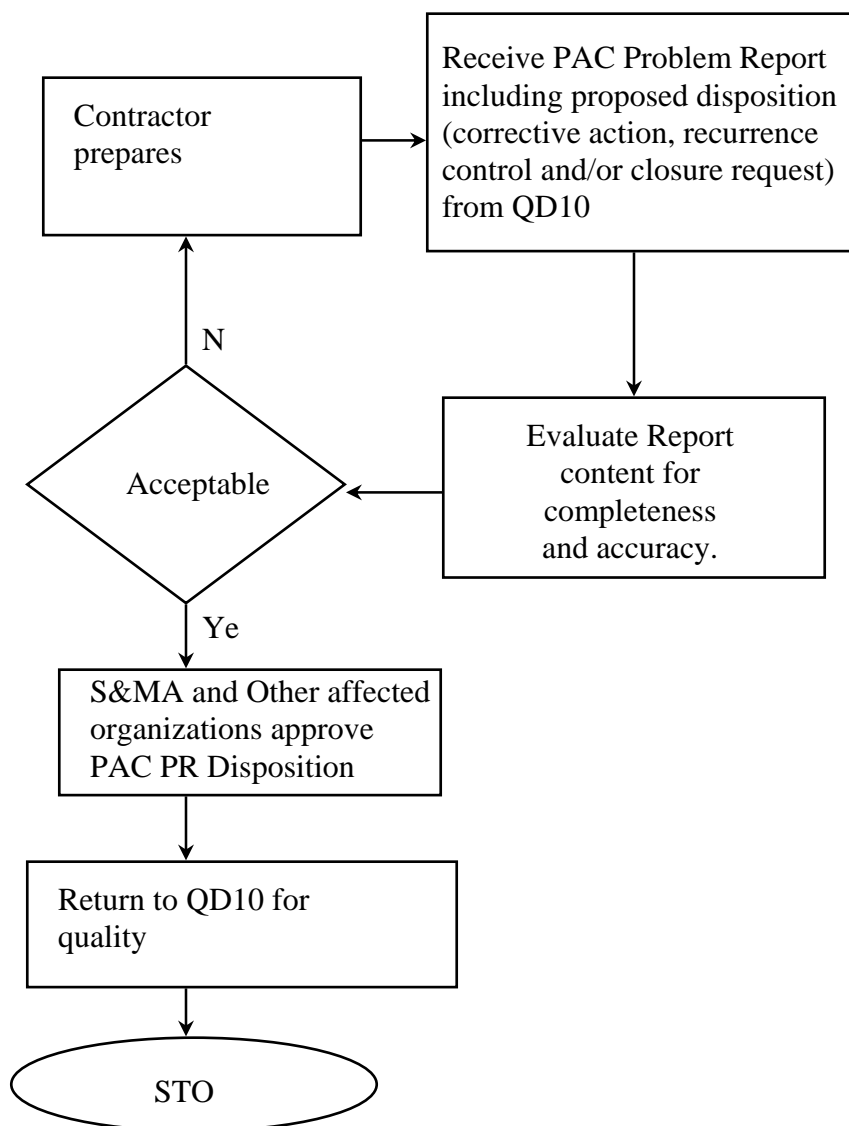
Appendix B

ALERT Processing



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Appendix C Problem Assessment



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Appendix D Systems Safety Evaluation

Change ID: _____ **Change Title:** _____

Evaluated By: _____ **Due Date:** _____

Description Of Change:

(1) Does the proposed change increase the probability that a hazard will occur?

Yes/No Explain: _____

(2) Does the proposed change increase the potential hazard severity?

Yes/No Explain: _____

(3) Does the proposed change create a new hazard cause or invalidate a current hazard control/verification?

Yes/No Explain: _____

(4) Does the proposed change decrease reaction time (crew or ground) used to control a hazard?

Yes/No Explain: _____

(5) Does the proposed change decrease the existing margin of safety (e.g. structural, thermal, operational)?

Yes/No Explain: _____

(6) Does the proposed change effect any safety data (e.g. hazard reports, CIL retention rationale, LCC's, OMRSD's)? If Yes, specify what changes are necessary.

Yes/No Explain: _____

(7) Does the proposed change adversely effect the intent of a safety related requirement or result in a noncompliance with applicable safety requirements?

Yes/No Explain: _____

(8) Is there any value added from the proposed change?

Yes/No Explain: _____

RECOMMENDED DISPOSITION:

Approve as Written..... _____ *Must provide justification above if any "Yes" responses to questions 1-7.*

Approve with Modification..... _____ *Provide required wording changes in "From/To" or "Add/Delete" language.*

Disapprove..... _____ *Provide rationale.*

Rationale:

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Appendix E Reliability Evaluation Form

Change ID:

Change Title:

Evaluated By:

Due Date:

Description Of Change:

1. Does the change introduce the addition of new or require modifications to : failure modes, failure causes, or retention rationale in the currently baselined FMEA/CIL?

Yes/No

2. Does the change eliminate any failure modes or failure causes currently identified in the baselined FMEA/CIL?

Yes/No

3. Does the change eliminate or adversely affect the intent of CIL retention rationale identified in the current baselined FMEA/CIL?

Yes/No

4. Does the change affect the criticality assignment of any hardware identified in the FMEA/CIL?

Yes/No

5. If all the above questions are answered "No", describe why there are no impacts.

RECOMMENDED DISPOSITION:

Approve as Written..... _____ *Must provide justification above if any "Yes" responses to questions 1-4 above.*

Approve with Modification..... _____ *Provide required wording changes in "From/To" or "Add/Delete" language.*

Disapprove..... _____ *Provide rationale.*

Rationale:

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Appendix F Quality Assurance Evaluation Form

Change ID: _____ Change Title: _____

Evaluated By: _____ Due Date: _____

Description Of Change: _____

DOES THE CHANGE

CIRCLE ONE

- | | |
|--|--------|
| 1) Result in a design and or manufacturing process change that could affect function or reliability? | Yes/No |
| 2) Introduce a more severe operating condition than the hardware was originally tested for? | Yes/No |
| 3) Involves a manufacturing source or location change? | Yes/No |
| 4) Result in a change to a specification, manufacturing process or procurement source for any material used in processing or operating flight hardware? | Yes/No |
| 5) Implements corrective action for a significant failure or anomaly detected during certification testing, assembly, checkout, flight or post-flight evaluation? | Yes/No |
| 6) Implements corrective action for recurrent failures nor covered in any proceeding criteria, such as repetitive failures during acceptance inspection and testing? | Yes/No |
| 7) Reduce inspectability? | Yes/No |
| 8) Degrade hardware/software quality | Yes/No |
| 9) Degrade cleanliness | Yes/No |
| 10) Affect contractual quality requirements? | Yes/No |
| 11) Conform to inspection or test criteria | Yes/No |
| 12) Affect any NDE? | Yes/No |
| 13) Void any completed acceptance testing? | Yes/No |

If any of questions 1-6 are answered "Yes", then a COQ revision will be required. Identify the COQ that will require a revision:

RECOMMENDED DISPOSITION:

Approve as Written..... _____ *Must provide justification above if any "Yes" responses to questions 1-13 above.*

Approve with Modification..... _____ *Provide required wording changes in "From/To" or "Add/Delete" language.*

Disapprove..... _____ *Provide rationale.*

Rationale:

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Appendix G S&MA Shuttle Change Evaluation

Change Number:

PCIN:

Title:

Description of Change:

Projects Affected

- ☐ SRB - CPE Name:
☐ RSRM - CPE Name:
☐ ET - CPE Name:
☐ SSME - CPE Name:

Evaluation Key

N/A - Not Applicable to this Office
A/C - Acceptable with Changes

A- Acceptable as Written
UNA- Unacceptable

S&MA Discipline Evaluations

Safety:
Reliability/Maintainability:
Quality Assurance:

S&MA Representative

Name of Evaluator /S/

Phone:

Date: xx-xx-xx

S&MA Disposition

Rationale